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| 10/524,692 | 10/17/2006 | Seiichi Okuda | KUD-002 | 1034 |

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| EXAMINER | |
|---|---|
| LOFFREDO, JUSTIN E | |
| ART UNIT | PAPER NUMBER |
| 3744 | |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/524,692 | OKUDA ET AL. | |
| | Examiner | Art Unit | |
| | JUSTIN LOFFREDO | 3744 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *28 September 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *2-6 and 8-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-6 and 8-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 February 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

1. The amendment filed Sept. 28, 2009 has been entered. Claims 2-6 and 8-13 remain pending in the application.

### *Specification*

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. **It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited.** The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The abstract of the disclosure is objected to because it exceeds 150 words in length. Correction is required. See MPEP § 608.01(b).

### *Claim Objections*

4. **Claims 8-13** are objected to because of the following informalities:

Consider claim 8, wherein there is a lack of antecedent basis in the claim for the limitation “said cooler”, which, for the purposes of examination, has been interpreted as - -said cooling chamber- -;

Consider claims 10 and 12, wherein "from the air refrigerant, heats and evaporates said refrigerant" (line 13 of each claim, including lines that have been struck through by applicant's amendment) should be written - -from the air refrigerant, *wherein the regenerator* heats and

evaporates said refrigerant- - in order to more specifically point out that the regenerator heats and evaporates the refrigerant mixed in the absorbent.

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. **Claim 2-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Okuda (JP 2003-302116) in view of La Fleur (US Pat. 3,355,903).

Consider claim 3.Okuda discloses: An air refrigerant type freezing and heating apparatus comprising: a compressor (22); a heating unit (23) disposed directly with a heating chamber (11) capable of heating the heating chamber (11), the heating unit (23) fluidically connected to the compressor (22) capable of receiving air refrigerant therefrom; a heat exchanger (24) which cools said air refrigerant outputted from said heating unit; a turbine (25) which expands said air refrigerant outputted from said heat exchanger; and a cooling chamber (12) through which air refrigerant outputted from the turbine (25) flows (see e.g. ¶s 0011-18; Dwgs 2-4).

Okuda fails to disclose a heat recovery unit which recovers heat of said air refrigerant outputted from said heating unit and heats said air refrigerant flowing between said compressor and said heating unit. The general concept of recovering heat from a process to heat up an incoming stream falls within the realm of common knowledge as an obvious mechanical expedient. This concept is well known in the art, as illustrated by La Fleur, which discloses recovering heat from a cycle to increase the heat of steam entering a turbine (hot regenerator 42). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the air refrigerant apparatus disclosed by Okuda to incorporate a heat recovery unit as taught by La Fleur to artificially raise the temperature of the warm room by recycling heat in order to improve the system operation by recovering a portion of the energy already expended to increase the temperature of the air refrigerant system in a way which allows for extremes of temperature without multiple turbines or an excessive amount of heating elements, thereby saving energy.

Consider claim 2. Okuda as modified discloses the invention as claimed, and Okuda specifically discloses that the compressor (22) is composed of a single compressor (22).

Consider claim 4. Okuda as modified discloses the invention as claimed, but fails to disclose a second heating unit which heats the heating chamber by heating the air refrigerant flowing on a subsequent stage side of said heat recovery unit and on a prior stage side of the heat exchanger. It has been held, however, that the mere duplication of the essential working parts of a device involves only routine skill in the art, and such duplication has no patentable significance unless a new and unexpected result is produced. In the instant case, the heating unit is an essential working part of the device, wherein the duplication of the heating unit results in the ability to heat the chamber, which is neither a new nor an unexpected result since Okuda discloses a heating unit (23) for heating chamber (11).

Consider claim 5. Refer to the rejection of claim 3. Okuda fails to disclose a heater which heats said air refrigerant flowing in said heating unit; however La Fleur teaches a refrigeration system incorporating a heater (44) which heats gas in a compression expansion system (see e.g. col. 5, L 10-15; Fig. 2) It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the air refrigerant apparatus disclosed by Okuda to incorporate a heater as taught by La Fleur so that the temperature of the air refrigerant flowing in the heating unit is raised in order to allow for extreme temperatures, which can be difficult to reach with an air refrigerant system. Such extreme temperature can be desirable, for example, in providing heat treatment in areas where the use of conventional heat pumps or furnaces is not advisable.

Consider claim 6. Okuda as modified discloses the invention as claimed but fails to disclose that the heater is an oven. It would have been obvious to one having ordinary skill in the

art at the time of the invention, however, to modify the heating device disclosed by Okuda as modified to be an oven in order to provide a common, readily obtainable appliance that could easily be adapted to this system while being multifunctional.

9. **Claims 8-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Okuda (JP 2003-302116) in view of Ishii (JP 2003-083634) and La Fleur (US Pat. 3,355,903).

Consider claim 10. Refer to the rejection of claim 3. Okuda also fails to disclose a regenerator which is filled with an absorbent that absorbs a refrigerant different from the air refrigerant, wherein the regenerator heats and evaporates said refrigerant mixed in said absorbent by using said air refrigerant outputted from said compressor; a condenser which condenses said refrigerant evaporated by said regenerator; an evaporator which evaporates said refrigerant condensed by said condenser and cools a cooling device by heat of evaporation; and an absorber which allows said absorbent outputted from said regenerator to absorb said refrigerant evaporated by said evaporator and outputs said absorbent to said regenerator.

Ishii teaches a heat pump system incorporating a regenerator which is filled with an absorbent that absorbs a refrigerant different from air refrigerant, wherein the regenerator heats and evaporates said refrigerant mixed in said absorbent by using said air refrigerant outputted from said compressor (21); a condenser (22) which condenses said refrigerant evaporated by said regenerator; an evaporator (24) which evaporates said refrigerant condensed by said condenser (22) and cools a third object by heat of evaporation; and an absorber which allows said absorbent outputted from said regenerator to absorb said refrigerant evaporated by said evaporator and outputs said absorbent to said regenerator (¶s 0008-14; Dwg. 1). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the air refrigerant

apparatus disclosed by Okuda to include a regenerator, condenser, evaporator and absorber from the heat pump system as taught by Ishii so that an absorption refrigeration cycle runs in parallel with the gas refrigeration cycle in order to provide the benefit of energy and cost savings from cooler temperatures in the cold room at a lower energy expenditure as compared with more conventional refrigeration cycles.

Consider claim 8. Okuda as modified discloses the invention as claimed, and Okuda specifically discloses that the compressor (22) rotates coaxially with said turbine (25), said air refrigerant taken in from said cooling chamber (12) is supplied to a low-temperature side flow passage of said heat exchanger (24), and said air refrigerant outputted from said low-temperature side flow passage is directly supplied to said compressor (22) (Dwg. 3).

Consider claim 9. Okuda as modified discloses the invention as claimed, and Okuda specifically discloses that the compressor (22) is composed of a single compressor (22) (Dwg. 3).

Consider claim 11. Okuda as modified discloses the invention as claimed, but fails to disclose a second heating unit which heats the heating chamber by heating the air refrigerant flowing on a subsequent stage side of said heat recovery unit and on a prior stage side of the heat exchanger. It has been held, however, that the mere duplication of the essential working parts of a device involves only routine skill in the art, and such duplication has no patentable significance unless a new and unexpected result is produced. In the instant case, the heating unit is an essential working part of the device, wherein the duplication of the heating unit results in the ability to heat the chamber, which is neither a new nor an unexpected result since Okuda discloses a heating unit (23) for heating chamber (11).

Consider claim 12. Refer to the rejection of claim 10. Okuda as modified fails to disclose that the apparatus further comprises a heater which heats said air refrigerant flowing in said heating unit; however La Fleur teaches a refrigeration system incorporating a heater (44) which heats gas in a compression expansion system (see e.g. col. 5, L 10-15; Fig. 2) It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the air refrigerant apparatus disclosed by Okuda as modified to incorporate a heater as taught by La Fleur so that the temperature of the air refrigerant flowing in the heating unit is raised in order to allow for extreme temperatures, which can be difficult to reach with an air refrigerant system. Such extreme temperature can be desirable, for example, in providing heat treatment in areas where the use of conventional heat pumps or furnaces is not advisable.

Consider claim 13. Okuda as modified discloses the invention as claimed but fails to disclose that the heating chamber is an oven. It would have been obvious to one having ordinary skill in the art at the time of the invention, however, to modify the heating chamber disclosed by Okuda as modified to be an oven in order to provide a common, readily obtainable appliance that could easily be adapted to this system while being multifunctional.

***Response to Arguments***

10. Applicant's arguments filed Sept. 28, 2009 have been fully considered but they are not persuasive for the following reasons:

11. In response to applicant's argument (Remarks, p. 6) that there a difference between the claimed invention and the prior art as follows: the oven in the claimed invention is not heated via a heat exchanger but is directly fed hot air from the compressor; and there is no heat exchanger and the heating is directly implemented by flowing air through the heating unit and then passing

it on toward the expansion turbine, examiner respectfully disagrees. It is noted that these features, upon which applicant relies (i.e., that the oven in the claimed invention is not heated via a heat exchanger but is directly fed hot air from the compressor; and that there is no heat exchanger and the heating is directly implemented by flowing air through the heating unit and then passing it on toward the expansion turbine) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

12. In response to applicant's argument (Remarks, p. 6) that with the open loop heating of the oven in JP '116 it would be impossible to meet the requirements of the last paragraph of at least claim 1 regarding the claimed "heat recovery unit," examiner respectfully disagrees. First, as noted in the rejection of at least claim 5, "Okuda [JP '116] as modified discloses the invention as claimed but fails to disclose that the heater is an oven." Examiner proceeds to provide a rationale as to why it would be obvious to modify the heater disclosed by Okuda as modified to be an oven (refer to the rejection of at least claim 5). Therefore, examiner did not in fact assert that JP '116 alone disclosed an oven as presented by applicant here. Furthermore, applicant argues that "it would be impossible to meet the requirements of the last paragraph of this claim which calls for a 'heat recovery unit,'" however applicant does not provide support as to why this would be impossible. Applicant asserts that "the air exhausting from the over in JP'116 must be, in light of any disclosure to the contrary assumed to be vented to the ambient atmosphere." This has not been considered by examiner because it is unclear (i.e. what is "the over in JP'116? And if

applicant intended to write "the oven in JP'116," this would still be unclear because JP'116 does not appear to disclose an oven).

***Conclusion***

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JUSTIN LOFFREDO whose telephone number is (571) 270-7114. The examiner can normally be reached on M - F 7:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler and Frantz Jules can be reached on (571) 272-4834 and (571) 272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cheryl J. Tyler/
Supervisory Patent Examiner, Art Unit 3744

/JL/
January 15, 2010